



Next Generation EPON Objectives

- Rate and Co-existence

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Rates and Coexistence objectives (as currently been discussed)

- **Rates objective:** Provide physical layer specifications operating over a single SMF strand and supporting:
 - MAC data rate of at least 25 Gb/s in downstream and at least 25 Gb/s in upstream
 - MAC data rate of at least 25 Gb/s in downstream and at least 10 Gb/s in upstream
 - MAC data rate of at least 40 Gb/s in downstream and at least 40 Gb/s in upstream
- **Coexistence objective:** Support coexistence with 10G EPON (EPON?) on same ODN

Interpretation of Rate objectives

- **Ethernet rate can be achieved by single lane or multiple lanes architectures**
- **25 Gb/s Rates objective implies:**
 - Both symmetric and asymmetric are single lane
- **40 Gb/s objective:**
 - Could be implemented as single lane or multiple lanes
 - Excludes hybrid 4x10 Gb/s hybrid WDM TDM architecture
- **However, define both signal lane 25Gb/s and signal lane 40 Gb/s at the same time does not make senses**
 - 25Gb/s is a subset of 40Gb/s
 - 25Gb/s is not necessary has big cost benefit over 40 Gb/s
 - Besides, 40Gb/s PON APD is not technically feasible or not mature
- **Therefore, the 40Gb/s objective should be understand as multi-lane architecture**

Coexist objectives -25G EPON

- **Assuming only consider coexist with closest generation**
 - In NG EPON case, only co-exist with 10G EPON will be considered
- **Single lane 25 Gb/s EPON could co-exist with 10 Gb/s EPON in upstream in TDM fashion**
 - Similar as co-exist of 10G EPON with EPON
 - 25 Gb/s EPON upstream wavelength therefore is 1270 nm
 - Only need to find a downstream wavelength for 25 Gb/s EPON, for example we could reuse 1490nm
- **Coexist of 25G EPON with 10G EPON is not a problem**

Coexist objectives – 40G EPON

- **40 Gb/s multi-lane EPON coexist with 10G EPON could be problematic:**
 - TDM co-exist scheme will not work since 40 Gb/s EPON needs four wavelengths for upstream
 - The only choice is WDM coexist
- **In WDM coexist scenario, 10 wavelengths are involved**
 - Wavelength resource: DWDM or CWDM?
 - Complexity
- **If we consider 25 Gb/s and 40Gb/s at the same time, we need to consider 2 different co-exist scenario**
 - TDM coexist and WDM coexist
 - More complex
- **Or, we not require coexistence in the 40G EPON case**
 - Consistency issue

Conclusions

- 25 Gb/s single lane EPON could coexist with 10G EPON with TDM in upstream
- 40 Gb/s multi-lane EPON coexist with 10G EPON is more difficulty, only WDM coexistence is possible and needs further study
- If we consider 25 Gb/s and 40Gb/s at the same time, we need to consider 2 coexist scenarios, coexist with WDM and TDM coexistence
- Or, we could consider not requesting coexistence in 40G EPON case



Thanks

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